have been noticed by my friend Mr. Thompson, President of the Belfast Natural History Society, in a communication to the 4th volume of the 'Annals of Natural History:' the head of one is in the museum of the Royal Dublin Society, that of the other is in the museum of the Natural History Society of Dublin; the skeleton of the third and largest (prepared by Lieut. Raye) has been presented by Sir Alan Bellingham to the Natural History Society. The drawing of a recent animal by Lieut. Raye adds considerably to the value of his communication.

Lieut. Raye's figure of this specimen resembles much more closely Dale's than Hunter's, particularly in the shape of the body and its proportional thickness, as well as in the manner in which the forehead rises from the snout: it differs from Dale's figure in the snout being much longer in proportion, in the lower jaw being longer and larger than the upper, and in the dorsal fin being placed nearer the posterior extremity of the body.

The teeth are conical, pointed, and evidently only rudimentary; and I could not learn that the palate was studded with any of those little horny eminences of tubercles which have been described, and are considered by Cuvier as rudimentary vestiges of whalebone.

LVIII.—*On Substances inclosed in Mochastones**. By Karl Mueller, Physician at Detmold. Translated and communicated by the Rev. M. J. Berkeley†.

[With a Plate.]

§ 1. *General Observations.*

Since in the present day the naturalist is busied with constantly increasing zeal in bringing to light the relics of an Antediluvian Flora, even the slightest contribution is welcome which adds a link to the great chain of those plants which are denominated fossil.

Moreover, although in many of these remains it is scarcely possible from fragments to determine in what part of the fossil flora they should take their place, such notices are at least a contribution to the history of those minerals in which they are found, and so far a mite towards the history of the original condition of the world.

On these grounds I venture to make some remarks on a subject which has at present, alas! received little attention.

* This word is evidently used with considerable latitude, and by no means confined to the bodies so named in this country.

† From the Regensburg Flora, May 21, 1842.

§ 2. *History.*

As far as I know, this matter was first noticed by Blumenbach in his 'Specimen archæologiæ telluris terrarumque impr. Hannov. scr. Gœtting. 1813,' in which he pointed out the organic nature of the so-called Dendrites, and even recognised amongst them genera which exist at the present day.

At a later period the subject was considered worthy of especial notice by Macculloch, who however laboured only to prove again their organic nature (Transact. of the Geolog. Soc. of London, ii. 510; Leonh. Taschenb. f. Mineral. xiii. 595*).

In this state the matter rested, and we merely find it mentioned occasionally in introductions to geology under the head Chalcedony.

§ 3. *On their Organic Nature.*

This question springs in part from the scarcity of the substance which gives rise to it, which is found only here and there in collections of minerals, and then preserved merely as a curiosity; in part, from the prevailing doubt as to their vegetable origin.

People are easily induced to consider them as dendritic growths of metallic substances, as indeed has been done by many mineralogists and botanists; but I have never heard of an explanation how such growths take place.

I must indeed add, that amongst these inclosed bodies others are found whose organic origin cannot be denied, though I have never found the former with such a form or texture under the microscope, without whose help no judgement can be formed.

While some allow their organic nature, we hear others too frequently speak of them as belonging to the category of sports of nature. But, it may be asked, what is a sport of nature? The dendritic formations in marly slate are brought forward as proofs of the existence of fortuitous forms in nature. How far they are related to the bodies in question I cannot say, not having paid especial attention to them.

Even they however depend on fixed laws, under whose activity they are produced, since their forms so constantly recur.

But how is it possible in the remotest degree to speak here of sports of nature, when so many forms so frequently recur in these inclosed bodies?

To prove their vegetable nature without the help of the microscope, Macculloch advised treating them with sulphuric acid, which turned them black. This method should seem however to be less practical than it appears at first, for many inorganic inclosed sub-

* It is to be regretted that M. Müller had no opportunity of seeing Mr. Bowerbank's admirable memoir, who however appears to have observed nothing which he considered as referable to the vegetable kingdom.—M. J. B.

stances may also become black under its influence. One circumstance indeed goes far to prove their vegetable nature, namely, that those portions of the mineral, whether it be chalcedony or quartz, where the bodies are exposed, do not admit of being polished, but being stained by the polishing-oil always remain tarnished.

§ 4. *On the Inclosed Bodies themselves.*

The number will probably be found considerable, when they shall have been rescued from the curiosity-drawer and have been observed and described. Something complete can be expected only from the labours of many. It is to be wished, for instance, that the botanists about Oberstein would turn their attention to this subject, where of a certainty many a treasure is thrown away as useless amongst the chips which are made by the agate-grinders.

I was permitted to examine a large quantity of inclosed substances, and what I discovered amongst them will for the most part appear from what follows.

1. Intricate deposits of different colours, mostly black or red-brown. They are very frequent, and resemble, under the microscope, mould; that is, they are compressed, transparent, without distinct cellular structure adhering after the manner of vegetables, and plainly converted into coal.

Since other vegetable substances frequently accompany these, it is clear that they are really mould which was formed before the mineral had received its present physical form. Found at Oberstein.

2. A moss in fructification. It was surrounded by such a mass of mould that it was impossible to discover anything accurately as to its structure, or to come to the least decision as to its genus. The capsule had the form of that of a *Hypnum*. The peristome was not present.

The fact however is of importance as a weighty argument against the devotees of sports of nature. Found at Oberstein.

3. In a bright, clouded chalcedony, in which traces of water were still visible, fragments of a *Chara* occurred. They consisted of fine, much-branched, glaucous green stems entangled with one another, and among which some branches occurred which were incrusted as if with lime. I could not discover any whirled fragments. The occurrence of water in chalcedony was interesting, which was confirmed by the late Prof. Zenker. Found at Oberstein.

In another reddish chalcedony I found a great mass of erect stems disposed with exceeding regularity. They were almost all in the same position, quite simple, and strongly incrusted with lime (?). The upper surface of the stone, where they were exposed to view, was sprinkled with black dots, which is very na-

tural, as such places, as said above, become black from the oil used in polishing. Found at Oberstein.

4. Plate X. *fig.* 1.—A Conferva in a green jasper [Prase]. Threads simple, short, curved, containing spiral threads (?). *b—d.*

I am obliged to place a note of doubt here, since I am not quite sure whether what I saw was a spiral as in *Zygnema*: I have figured what I did see at *b*.

It is a very difficult task to examine objects like this. We can examine only that portion which lies close to the surface, and it is then always matter of chance whether one falls in with anything of interest. I was unable to prepare thin sections, as the specimens were not my own property.

I was besides obliged to make my observations mostly by means of concentrated lamp-light, in order to transmit more light through the whole stone, and may therefore have been subject to some optical deception.

I could not ascertain the exact place in the system of Algæ to which the Conferva belonged, being unable to ascertain its inner structure. The thickness of the threads, which are distinct though congregated, seems to place them in the series of true *Confervaceæ*, as *Conferva, Zygnema,* &c.

In conformity with the intention of these notes, I am content to draw attention to the fact, in the hope that later inquiries, should I be so fortunate as to meet again with similar objects, may throw more light upon the matter. Found in Scotland.

5. Plate X. *fig.* 2, *a*.—Mass lobed, glaucous green, compressed.

A remarkable formation, resembling altogether a compressed dried *Nostoc,* which it resembles also in colour. Indeed I know not with what else to compare it.

The vegetable has certainly once been a *frons plicata,* since we find the single folds lying one over the other. They are not of equal thickness; their colour is also here and there darker, where the layers of folds are darker. The outline is very delicate and distinct.

Under the microscope the whole appears like a compressed macerated mass. I could not perceive the moniliform sporidia which are peculiar to the genus *Nostoc,* probably in consequence of their having been separated from one another by enormous pressure.

The great distinctness of the frond seems to bespeak its affinity to *Nostoc,* as the lower Algæ, *Palmella, Coccochloris, Microloa,* &c., under such pressure would scarcely have preserved their outline, their mass being too gelatinous, while in most species of *Nostoc* it is of a firmer consistence. From want of globules it is impossible to name it.

Fig. 2, *b—g*.—In certain portions of the frond under small magnifying powers appear some darker specks. If these are followed

up gradually with higher powers they appear as represented at *b*—*g*; they are of the same colour as the frond and lie scattered upon it, as if pressed to it. They are tender, scale-like membranes (?) jagged at the border.

It is surprising to find structures like these, which are the last one should expect to find upon what, judging from habit, I have considered as a *Nostoc*.

Many no longer retain their original orbicular form; and more are frequently torn into many divisions as at (*e*).

If we inquire what this formation probably is, it is very pleasing to be able to give a certain answer: they are forms which belong to the great family *Desmidiaceæ* amongst Algæ, and indeed to the genus *Micrasterias*.

It has the greatest affinity with *Micrasterias lacerata*, Kützing, and I leave it for a while to the judgement of algologists.

Since hitherto *Micrasteriæ* are known only as hydrophytes, the *Nostoc* must also be a water Alga. Found at Idar in the principality of Birkenfeldt.

6. *Fig.* 4—9.—More or less round, pinnate, moss-like fronds, with a yellow-brown substratum, in the middle of which is generally a circle with a dot in its centre. Under the microscope the texture appears as in the foregoing, macerated, and we can therefore judge only from habit what the production may be.

If we examine first the circle in its centre, with its own central dot, it appears that this is the point to which the object was fastened, and from whence as a centre the other branches proceeded. It must have been gelatinous, more or less globose, as appears from the gradually fading colour and the very thin compressed membrane; it must have been conglobated, so as to receive its present orbicular form. The feather-like lines were branches, whose branchlets were also gelatinous and conglobated.

This again then belongs to the family of Algæ, being most nearly allied to *Chætophora* amongst the *Nostochineæ*, whose frond, as in *Chæt. endiviæfolia*, exhibits a similar branched structure. Found in a clear chalcedony from Oberstein.

7. *Fig.* 10.—Red organic masses, appearing to the naked eye as small, more or less isolated dots, occurring in a clear chalcedony. The circumjacent parts are yellow. This yellow field is bordered by similar red dots, only larger and more distinct and tolerably isolated.

Under a weak magnifying power they appear like more or less oval balls, generally very regular, sometimes much torn and crushed, the one dark red, the other reddish yellow.

As in fig. 2, a higher magnifying power surprises the inquiring eye, when these dots, which still appear superficial and isolated, are found to exhibit the forms represented in the figures *c*—*s*.

c, d, f, g, h, i, k, l, n lie mostly at the side of the yellow field at (*a*); the remaining figures in the midst of the chalcedony, which they completely fill.

The first appear as large, globular and spiral, the latter as more or less oval; these again as reddish yellow, those as almost tile-red bodies. Both have the same peculiarity, that they assume the form of a mushroom: *e, f, m, o, p.* There occur also frequently thin, skinny, banded remains, as at *g.* Their size is very variable. At the first glance all these bodies have so much resemblance to the fruit of *Characeæ,* that one might feel satisfied in considering them as such in reality. The banded spiral divisions bespeak as much; yet it does not appear probable, as the bodies, so frequently confined to a small space, lie collected together in heaps. No single organic remain is found amongst them, and it is besides inconceivable that, supposing them to be the fruit of *Charæ,* not a single vestige of the stem should remain.

That amongst them clearly younger individuals and of a similar formation are perceptible, may afford an argument that they could be assigned to the animal kingdom. I have not observed extremities, feet, &c.

I cannot venture to say more on this matter, but perhaps the same bodies may be found by some other observer under other peculiar circumstances, whence we may fortunately be able to draw some conclusion. Found in Siberia.

8. *Figs.*3 & 11.—*Fig.* 11. I have given in fig. *a—k* the magnified representations of the very isolated red dots at (*a*) in a chalcedony likewise from Siberia. They may be thought very confused, but they are true copies of what I saw. The single dots are of such a size that their outline can be distinguished by the naked eye. I have figured almost every dot which lying near the surface could be distinctly observed, and almost every one bore the marks of powerful destruction.

In spite of this inroad on these so remarkable and beautiful red bodies, it is not difficult to form a clear notion of the original form from the individual fragments.

The body was circular, as appears easily, and the figures *f, d, g* seem to give perfect assurance of the fact, since only a round body could be pressed so flat, as is the case in both these instances. Some other dots which I found showed the same form and structure, so that I considered it superfluous to figure them here for further confirmation. I give exactly what I found.

The circular body was moreover furnished with an epidermis, as is clear from *d, g, h.* This seems to have been dark red. It was filled with a loose marrow (*b—k*) inclining from orange to purple-red. Where this was extremely compressed the colour is of course lighter, in consequence of the mass being thinner. This is illustrated by *b—e.*

In the centre of the globular body was a conformable dark red nucleus *e—h, k.*

Finally the whole mass was gelatinous; as is indicated by the thick indistinct outlines of all the figures and by the body marked (*i*), from whose central opening the nucleus appears pressed, which betokens clearly a gelatinous nature.

The nucleus is found of various sizes, probably merely from difference of age. At (*k*) one is seen almost isolated.

Fig. 3.—These figures also belong here, and are remarkable and interesting enough. This chalcedony came from Oberstein, whereas the other came from Siberia. The globules marked in outline are here more aggregated than in fig. 11, but they exhibit the same structure and colour.

What these bodies are I dare scarcely conjecture. Here also there are no organic remains; and would we compare them with some vegetable organ, the most appropriate should seem to be some kind of berry. I must however repeat what was said under fig. 10: the collection of the bodies into a small space, and the absence of other organic remains, are against such a supposition.

Have we however before us some pristine inhabitant of the water belonging to the animal kingdom? If so, the black nucleus must represent some organ; possibly the stomach.

We must here also wait patiently for further researches, and content ourselves with the little which I am able with my feeble powers to offer. May they only lead to further inquiries; if so, I shall be satisfied.

§ 5. *In what state are the Inclosed Substances found?*

If the worthy Goeppert, in the introduction to his work on fossil plants, assumes three conditions (vid. Flor. 1840, p. 482), this section may be regarded as indicating a fourth. For here clearly the plants have undergone no chemical change. They were inclosed in the original soft mass of the chalcedony, and so, when this hardened, became impervious to atmospheric air and other chemical agents. As also amber and copal present their insects well-preserved, so here the mineral offers us its plants.

The whole alteration consists merely in the highly compressed state in which most of the objects are found. The substance of the plants is still precisely what it was at first.

In conclusion I have only to state, that all the objects examined are in the admirable mineralogical collection of M. Siegismund of Jever, a most excellent and obliging naturalist.